

REMARKS

This communication is in response to the Office Action mailed on May 15, 2002. In the Office Action, claims 1-83 were pending. Claims 28, 29, 34, 35, 41, 42 and 80-83 were withdrawn from consideration. Claims 1-27, 30-33, 38-40, 43-54 and 56-79 were rejected. Claims 36, 37 and 55 were objected to. With this response, claims 1-27, 30-33, 36-40 and 43-79 are cancelled. New claims 84-99 (drawn to a fabric assembly with plates) are presented for examination and favorable action.

In paragraph 4 of the Office Action, the examiner required affirmation of a provisional election made during a conversation between the examiner and Mr. Steve Koehler on March 5, 2002. Applicants hereby confirm the election to prosecute the invention of Group I (claims 1-27, 30-33, 36-40 and 43-79, drawn to a fabric with plates). New claims added by this Amendment are consistent with the election.

RESPONSE TO OFFICE ACTION OBJECTIONS

In paragraph 5, the Office Action objected to the Specification stating that the line spacing made reading and entry of amendments difficult. Per Examiner's request, a replacement application with double spaced lines is hereby submitted herewith. No new matter has been included in the replacement application.

In paragraph 6, the Office Action objected to claims 36, 37 and 55 under 37 C.F.R. 1.75(c) as being in improper form because a multiple dependent claim cannot depend on a multiple dependent claim. Accordingly, claims 36, 37 and 55 were not examined on the merits. Claims 36, 37 and 55 have been cancelled.

In paragraph 8, the Office Action rejected claims 8 and 9 under 35 U.S.C. § 112 as being indefinite because there was insufficient antecedent basis for "the continuous portions" and "the discontinuous portions" in claims 8 and 9, respectively. Claims 8 and 9 have been cancelled.

The Office Action rejected claims 1-7, 10-12, 14-21, 23, 25-27, 30, 33, 39, 43, 45, 59 and 60 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 1,758,296 to Schaumann (hereinafter Schaumann). Claim 40 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,306,532 to Tsien et al. (hereinafter Tsien et al.) Claims 8, 9, 22, 24, 31, 32, 38, 44, 46-54, 56-58, 61-79 were rejected under 35 U.S.C. §103(a) as being unpatentable over Schaumann. Claim 13 was rejected under 35 U.S.C. §103(a) as being unpatentable over Schaumann in view of U.S. Patent No. 4,292,882 to Clausen (hereinafter Clausen).

As stated above, claims 1-27, 30-33, 36-40 and 43-79 have been cancelled. New claims 84-99 are hereby submitted which are believed to render the rejections of the above-mentioned claims moot.

PATENTABILITY OF NEW CLAIMS OVER CITED REFERENCES

New claims 84-99 are believed to be properly supported by the Specification as originally filed and that these new claims are patentable over the cited references Schaumann, Tsien et al., and Clausen. Of these new claims, claims 84 and 93 are independent. In particular, new claims 84-99 are supported at least by FIG. 32 and FIGS. 27A, 27B and 27C and accompanying description.

Schaumann

The Office Action states that Schaumann discloses body armor made by arranging plates of bulletproof material between

several layers of a strong but flexible material. The plates are placed in a spaced arrangement among three layers such that the plates are staggered. The fabric acts both as a connecting material and a base layer. Metal netting can be incorporated into the fabric.

However, it is believed that Schaumann does not show, teach, or suggest all the limitations of new independent claim 84 or 93. New claim 84 recites, in part, a fabric assembly comprising a flexible substrate having a top surface and a plurality of metal plates having substantially uniform thickness of approximately 2 to 5 mils, the plurality of metal plates affixed to the top surface of the flexible substrate and arrayed in a pattern such that a plurality of gaps are defined between adjacent affixed plates, wherein the gaps are approximately uniform in width and wherein the gap width is approximately 2 to 5 mils.

Clearly, Schaumann does not specify ranges in either plate thickness or gaps between adjacent plates as does claim 84. Also, the plates in Schaumann are not arrayed in a position that defines a plurality of gaps approximately uniform in width. The gaps in the Schaumann plates apparently are much larger in the vertical than horizontal direction. Therefore, it is believed that claim 84 is patentable over Schaumann.

New independent claim 93 recites, in part, a fabric assembly comprising a flexible substrate having a top surface, a plurality of polymeric resin plates having substantially uniform thickness of approximately 5 to 20 mils, the plurality of plates affixed to the top surface of the flexible substrate and arrayed in a pattern such that a plurality of continuous gaps are defined between adjacent plates, wherein the gaps are approximately uniform in width, and a wire mesh embedded in each plate and completely covered by the top surface of each plate.

Claim 93 defines polymeric resin plates and a wire mesh that is embedded in and completely covered by the top surface of each plate. In contrast, Schaumann describes bullet-proof plates that are woven together with steel or wire netting. [Col. 1, line 12] It is believed that interweaving bullet-proof plates together with steel netting is quite distinct from embedding a separate wire mesh in each polymeric plate where the top surface of each plate completely covers the wire mess. In the present Specification and claim 93, the mesh structure is individual plate-shaped meshes designed to provide structure and stability to each plate and not for connecting adjacent plates as in Schaumann.

In light of the foregoing, it is believed that claim 93 is patentable over Schaumann.

Tsien et al.

The Office Action states that Tsien et al. discloses a protective garment having an array of metal plates held in a spaced array by another layer of metal plates.

It is believed that claims 84 and 93 are both patentable over Tsien et al. because Tsien et al. does not teach, show or suggest all of the features of claims 84 or 93. Tsien et al. is a protective garment made of an assembly of hard plates. The Tsien sheet assembly has a first plurality of hard plates each having a plurality of apertures. A second plurality of plates each has a center stud and side flanges. The first and second pluralities of plates connect at the apertures and center stud and again at the side flanges to form a sheet assembly.

Claims 84 and 93 are both fabric assemblies comprising a flexible substrate with a plurality of plates affixed to the flexible substrate where gaps are formed between adjacent plates.

The Tsien et al. assembly does not show a flexible substrate or plates that are affixed to this substrate. The Tsien et al.

plates are interconnecting and overlapping while the plates in both claim 84 and claim 93 are arrayed so that there are gaps between adjacent plates.

In light of the foregoing, it is believed that claims 84 and 93 are patentable over Tsien et al.

Clausen

Finally, the Office Action cites Clausen as a secondary reference in combination with Schaumann against claim 13. The Office Action states that Schaumann does not disclose an abrasive surface on the plates, but Clausen teaches an armor material, wherein a steel plate is provided with an abrasive surface. Therefore, it was considered obvious to one skilled in the art to provide an abrasive surface to the plates of Schaumann in order to create plates that can better deflect ballistic and projectile forces.

Clausen shows bullet-proof light armor comprising a plurality of sheets woven from high tensile strength synthetic fibres with abrading means such as abrasive particles. The purpose of the abrasive particles is to abrade the surface of bullets so that the fibres can better grip the bullets to prevent penetration of the bullet-proof barrier.

New independent claims 84 and 93 are entirely distinct from Clausen because Clausen does not use a flexible substrate and affixed plates whatsoever as does both claims 84 and 93. Further, Clausen appears to teach away from a penetration resistant material made from plates by stating, "In the past, light armor ordinarily consisted of heavy rigid plates and the like established of dense, strong, metal alloys, ceramics and the like. The amount or extent of protection afforded by such armor was generally proportionate to its thickness and resulting weight. Due to the weight and rigid characteristics of materials used in such armor, the amount and/or effectiveness of armor that

could be effectively provided in each application was materially restricted and/or limited." [Col. 1, lines 24-34] Apparently, solid plates were not considered desirable in Clausen as the invention itself is designed to replace prior art solid plates. In contrast, both of claims 84 and 93 employ solid plates. Therefore, it is believed that claims 84 and 93 are patentable over Clausen.

In light of the foregoing, new claims 84 and 93 are believed to be patentable over the cited art and are presented for examination and favorable action. Claims 85-92 and claims 94-99 depend on claims 84 and 93, respectively, and are believed to be separately patentable. Consideration and favorable action as to claims 85-92 and 94-99 are respectfully requested.

Supplemental Information Disclosure Statement

It is hereby noted that a supplemental Information Disclosure Statement is being submitted herewith. Without commenting on the relevance of any other reference, the undersigned believes the claims added by this Amendment are patentable over Japanese Reference No. 08-120574, a translation of which is also provided.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

Steven M. Koehler, Reg. No. 36,188
Suite 1600 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

SMK:LPJ:tas